

Determinants of foreign direct investment in eight ASEAN countries



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ARTICLE INFO

Received : 12-03-2024
Revised : 05-09-2024
Accepted : 11-09-2024
Published : 25-09-2024

Keywords

Foreign direct investment
Seemingly unrelated regression
Capital inflow
Political stability

ABSTRACT

This research aims to analyze the influence of economic growth, labor, regulatory quality, political stability, and carbon emissions on Foreign Direct Investment (FDI) in eight member countries of the Association of Southeast Asian Nations (ASEAN). With strong economic growth, a qualified workforce, good regulations, stable politics, and low environmental degradation, ASEAN member countries have great potential for investment, which generates long-term returns. This makes the ASEAN region interesting to analyze the factors that influence FDI in the region. Using the Seemingly Unrelated Regression (SUR) method and secondary data from the World Bank, this study combines cross-sectional and time-series data to provide a comprehensive overview. The research findings indicate that variables such as labor, regulatory quality, political stability, and carbon emissions have a significant impact on foreign direct investment in ASEAN countries. These findings underscore the importance of these factors in determining the direction and volume of foreign investment. This study contributes significantly to understanding the dynamics of foreign investment in the ASEAN region and highlights the importance of efforts to improve political stability, regulatory quality, and manage carbon emissions to drive economic growth through foreign capital inflows. The implications of these findings can serve as a policy foundation for governments and stakeholders in ASEAN to enhance the attractiveness of foreign investment.

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1. Introduction

The Association of Southeast Asian Nations (ASEAN) is a cooperative initiative among countries in the Southeast Asian region, consisting of ten member states formed with the intention of promoting economic growth, developing the culture of its member countries, maintaining stability and peace, and providing opportunities for its members to resolve differences peacefully. To drive economic growth and progress, developing countries require an increase in financial resources, particularly through capital inflows, especially from foreign investments (Kumari & Sharma, 2017). Foreign Direct Investment (FDI) holds a pivotal role in shaping the economic landscape of a nation. Fresh capital from foreign investments can be utilized for various purposes, including public infrastructure development, establishing new businesses, or expanding existing ones. To enhance the domestic economy, every country will continually strive to create economic conditions that stimulate investment activities (Kambono & Marpaung, 2020). Foreign Direct Investment (FDI) encompasses investments made by foreign entities, be they individuals or governments, into the economy of another country. The primary objective is to establish enduring interests and control over companies or businesses within the host country (Aprianto et al., 2020).



Foreign Direct Investment (FDI), particularly, can serve as a strategy to address economic crises. The presence of FDI can stimulate technological advancement, productivity, and economic growth (Thanh et al., 2019). Foreign companies invest in a country, they often initiate the establishment of new businesses or the expansion of existing operations. This, in turn, results in the generation of new employment opportunities, contributing to a reduction in unemployment rates and offering a source of income for the local population (Astuty et al., 2018). The fluctuations in foreign direct investment (FDI) in a country are shaped by a range of economic and non-economic factors. The notable economic growth experienced in the Southeast Asian region (ASEAN) has played a pivotal role in fostering an increase in foreign direct investment in the area. If a country experiences stable and convincing economic growth, it enhances investor interest in making investments (Pasara & Garidzirai, 2020). Furthermore, robust economic growth can also create new job opportunities and increase overall income for the population. This, in turn, can enhance the purchasing power of the community and contribute positively to domestic consumption (Jayachandran & Seilan, 2019). Therefore, positive economic growth not only opens opportunities for business and investment but also provides benefits for the overall well-being of the society.

High economic growth has a significant impact on various aspects within an economy. As economic growth increases, it tends to stimulate the demand for various goods, products, and services. This surge in demand can have positive effects on the business and industrial sectors, boosting sales and production for companies. The rise in production and sales can subsequently lead to increased profits for companies operating in a rapidly growing economic environment (Febiyansyah, 2017). Agénor (1998) argued two main factors in determining capital flow and divided into internal factors (pull factors) and external factors (push factors). Internal factors involve domestic policies such as high productivity levels, stable economic growth, a strong macroeconomic foundation, macroeconomic stability, and structural reforms. Increasing rankings often become positive indicators for foreign investors. On the other hand, external factors involve global interest rates, especially in the United States and other developed countries, which can lead to a decrease in risk premiums. Additionally, a recession or decline in economic growth in developed countries can encourage the shift of capital from developed countries to developing markets. Overall, the combination of these factors forms a complex landscape that affects capital flows and requires careful analysis to understand changes in global investment.

Furthermore, the workforce in a country is crucial in attracting investors. Mantra (2000) emphasizes that having a skilled workforce can bring about diverse business opportunities and lead to increased productivity. Investors often consider the availability of labor when deciding to invest their capital. The ability to access a large workforce not only creates a dynamic business environment but can also serve as an incentive for investors to engage in investments (Ullah & Khan, 2017). According to Fatihudin (2019) investors may not always require high-quality labor, a skilled workforce can have a positive impact on investment. Early work from Djojohadikusumo (1994) argued workforce includes all individuals who are willing and able, and this category encompasses those who work independently, family members who do not receive payment, and those who work for wages or salaries. The availability of the workforce is a critical element that can contribute to the competitiveness of a country or region. High productivity levels can act as a magnet for investors, presenting promising investment opportunities.

A government capable of effectively regulating its economic activities will reduce transaction and production costs, thereby increasing the potential profits for foreign investments (Samputra & Munandar, 2019). Suryadharma (2011) states The success of a country in achieving good regulatory quality is crucial in shaping a stable business environment, which, in turn, will stimulate investment growth. Silalahi (2020) emphasize that regulations not only serve as control instruments but also act as guarantors of justice. This aims to prevent abuse by companies investing in a country. Therefore the quality of regulations in the host country is crucial for every investor (Paul & Jadhav, 2020). Governments in developing countries formulate market-friendly and appropriate policies to foster the private sector and encourage foreign investors (Saha et al., 2022). The quality of a country's regulations is reflected in the number of policies and the public's response to them. The importance of this factor can be identified through three main aspects. First, the efficiency of state institutions in creating a robust regulatory framework can enhance local production and attract investments. Second, poor regulations can result in inefficient governance and increase the risk of corruption. Third, risks and uncertainties in FDI can harm the economy and reduce the interest of foreign investors (Nizam & Hassan, 2018).

Political stability can also be assessed based on the potential for demonstrations and riots, except when these demonstrations are related to labor issues. These activities can lead to damage to assets and the arrest of individuals, particularly if they disrupt public life and business operations. Another factor to consider is the intensity of conflicts involving ethnic, religious, and interregional tensions, all of which are part of measuring the variable of political stability. Political stability and the distribution of power in a country are determining factors for political risk (Abdella et al., 2018). Key factors influencing decisions when allocating capital in a country include a stable political environment and a robust legal enforcement system. An unclear or unstable political situation can pose a serious obstacle to investors, especially because foreign investors tend to be highly sensitive to such issues. The stability in the political arena allows the government to minimize risks when acquiring private property for public purposes and redistributing their resources to facilitate entry into financial markets, leading to internalization advantages through heightened Foreign Direct Investment (FDI) inflow (Sharmin & Khandaker, 2015). Foreign investors, being sensitive to political factors, may potentially avoid investing in a country that does not offer a comfortable political situation. Awareness of risks and uncertainties in the political environment makes investors more likely to choose a country with guaranteed political stability. Therefore, creating a comfortable situation for investors involves not only political stability but also policies that support economic and legal stability.

In connection with economic growth in the perspective of sustainable development, environmental factors are considered to influence Foreign Direct Investment (FDI) through carbon emissions. Carbon dioxide emissions refer to the release of carbon gases into the atmosphere. High levels of these gases in the atmosphere cause several problems (Zheng et al., 2020). Carbon emissions contribute to air and water pollution, causing a rise in health problems within the affected areas. Furthermore, a critical aspect of this process pertains to financial considerations. International financial institutions may exhibit reluctance in providing loans to companies operating in nations with high carbon emissions (Franco-Luesma et al., 2020). In this context, countries with high carbon emissions are criticized by various individuals and institutions (Pompermayer Sesso et al., 2020). This loss of image poses several problems for countries. High carbon emissions in a country tend to lower investor confidence as it is considered a negative signal that can impact investor reluctance to invest (Yuksel et al., 2020). This reluctance can lead to a substantial reduction in investments within these countries. Essentially, foreign investors might be hesitant to engage in countries grappling with emission-related challenges, resulting in a decrease in overall investments (Gong et al., 2019). Reduce in investment levels contributes to job losses and heightened healthcare expenses, ultimately negatively impacting the country's economy. This study explores the effect of economic growth, labor, regulatory quality, political stability and carbon emissions on Foreign Direct Investment (FDI) in 8 ASEAN countries. ASEAN member countries are countries that have great potential as a forum for investment with strong economic growth, a fairly qualified workforce, good regulatory quality, stable politics and minimal environmental degradation so that they have long-term advantages.

2. Method

The research employs a panel data regression by combining of time-series data (2003-2022) and cross-section (Brunei Darussalam, Indonesia, Cambodia, Malaysia, Philippines, Singapore, Thailand, and Vietnam) and examine the independent variables, namely economic growth, labor force, regulatory quality, political stability, and carbon emissions, concerning the dependent variable, foreign direct investment, in eight ASEAN countries. The basic equation of panel data as follows:

$$\ln FDI_{it} = \beta_0 + \beta_1 EG_{it} + \beta_2 \ln LF_{it} + \beta_3 RQ_{it} + \beta_4 PS_{it} + \beta_5 CE_{it} + \varepsilon_{it} \quad (1)$$

Where $\ln FDI$ is the foreign direct investment (natural logarithm); EG is the economic growth; $\ln LF$ is the labor force (natural logarithm); RQ is the regulator quality; PS is the political stability; CE is the carbon emission; β_0 is the constant; $\beta_1 - \beta_5$ is the coefficient of independent variables; i the notation for cross-section; t the notation for time-series and ε is the disturbance. In the analysis of panel data regression, several assumptions such as heteroskedasticity and multicollinearity are often not met. As a solution to address these issues, the Seemingly Unrelated Regression (SUR) method is commonly applied. Zellner (1962) argue the SUR model is a type of multivariate regression integrated into the structure of linear regression. This model consists of several equations systems that are not directly connected, with correlation between errors from different systems. The use of SUR allows handling unmet assumptions and enhances the validity of regression analysis on panel data.

In the presence of violations of the heteroskedasticity assumption, a suitable estimation method is Feasible Generalized Least Squares (FGLS). This method is applied when the variance-covariance matrix structure of the residuals is assumed to be heteroskedastic, and there is cross-sectional correlation. Thus, the implementation of FGLS can be an effective approach to address the non-compliance with these assumptions (Greene, 2018). The equation as follows:

$$\gamma_j = x_j \beta_j + \mu_j \tag{2}$$

Where the vectors γ_j and μ_j are of dimension n, the parameter vector β_j , and the covariate matrix x_j is of size n x p_j. Thus, when m is used collectively, the model can be described as follows:

$$\begin{bmatrix} \gamma_1 \\ \gamma_2 \\ \vdots \\ \gamma_m \end{bmatrix} = \begin{bmatrix} x_1 & 0 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & \dots & x_m \end{bmatrix} \begin{bmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_m \end{bmatrix} + \begin{bmatrix} \mu_1 \\ \mu_2 \\ \vdots \\ \mu_m \end{bmatrix} \tag{3}$$

The term "error term value" is assumed to have a mean value of 0 and be independent of individual components, as well as homoscedastic. Also, μ_j has assumptions, namely the mean of the error term: $E(\mu_j | \chi) = 0$. The variance value of the error term in equation j is $E(\mu_j \mu_j' | \chi) = \sigma_{jj} I_N$, the covariance values of the error term for each individual from equation j and j' are $E(\mu_j \mu_{j'}' | \chi)$ where $j \neq j'$, and the total covariance-variance matrix is expressed as $\Omega = E(uu') = \Sigma \otimes I_N$. Overall, in the context of linear regression equations, there are consistent estimates for the parameters β that can be enhanced to:

$$\beta_{GLS} = \{\chi'(\Sigma^{-1} \otimes I_N)\}^{-1} \{\chi'(\Sigma^{-1} \otimes I_N \gamma)\} \tag{4}$$

The use of data in this research, including economic growth, labor force, regulatory quality, political stability, and carbon emissions, may result in correlations in the disturbance term values, impacting the efficiency of the estimators. In this regard, one of the applied analytical models is the Panel Seemingly Unrelated Regression (SUR). Thus, the disturbance term values for country i in a specific period may correlate with the disturbance term values for the same country in a different period because the data on these independent variables are interrelated between the years t and t-1. The panel SUR method is known to generate efficient estimators even in the presence of correlation among disturbance terms in an equation (Zellner, 1962).

3. Results and Discussion

Table 1 shows the observation around 160 and the average Foreign Direct Investment (FDI) to the eight ASEAN countries during the period 2003-2022 reached \$13.9 billion per year. The peak FDI occurred in Singapore in 2022, reaching \$141 billion, while the lowest value was recorded in Thailand in 2020 with a total of \$-4.95. The average economic growth rate in these eight countries is 4.5%, with the lowest growth rate in the Philippines in 2020 (-9.5%) and the highest in Singapore in 2010 (14.5%). The Labor variable shows an average of 34.5 million individuals. The lowest number of labor was recorded in Brunei Darussalam in 2003 (166 thousand individuals), while the highest number occurred in Indonesia in 2022 with a value of 137 million individuals. The Regulatory Quality Index has an annual average of 58, with Singapore reaching the highest index (100) in 2012-2022 and Indonesia recording the lowest value (19) in 2003. The Political Stability Index has an average of 48, with Singapore achieving the highest value (99) in 2008, and Indonesia has the lowest value (3) in 2003. The average annual carbon emissions are 5.58 tons per capita, with Brunei Darussalam recording the highest emissions in 2022 (23.95 tons per capita), and Cambodia recording the lowest emissions in 2003 (0.18 tons per capita).

Table 1. Descriptive Statistics

| Variable | Obs | Mean | Max | Min | Std Dev |
|----------|-----|-----------|-----------|------------|-----------|
| FDI | 160 | 1.39e+10 | 1.41e+11 | -4.95e+09 | 2.34e+10 |
| EG | 160 | 4.546.338 | 1.451.975 | -9.518.295 | 3.494.524 |
| LF | 160 | 3.45e+07 | 1.37e+08 | 166039 | 3.78e+07 |
| RQ | 160 | 5.836.348 | 100 | 1.945.946 | 2.239.229 |
| PS | 160 | 4.756.597 | 9.904.762 | 3.015.075 | 3.009.092 |
| CE | 160 | 5.583.875 | 23.95 | 0.18 | 5.669.475 |

Source: data processed

In this study applying the SUR for panel data to transform coefficient values and standard errors to be more efficient and free from bias in the research variables. The advantage of the SUR panel test is its efficiency in estimating parameters by considering all regression equations and contemporaneous errors in the estimation process. Table 2 shows the probability values, there are several independent variables influencing the dependent variable, as evidenced by probability values less than alpha (0.05). These influential independent variables include labor force, regulatory quality, and political stability with a probability value of 0.000, and the carbon emission variable with a probability value of 0.003. On the other hand, one of the independent variables exhibits a probability value higher than alpha (0.05), indicating that this variable does not exert a significant impact on the dependent variable. This independent variable is the economic growth variable with a probability value of 0.329.

Table 2. Result of Panel Seemingly Unrelated Regression

| Variables | Coefficient (Std Error) |
|-----------|----------------------------|
| C | 1.502 (1.258) |
| EG | 0.018 (0.209) |
| LnLF | 1.005 (0.693)*** |
| RQ | 0.051 (0.004)*** |
| PS | 0.038 (0.004)*** |
| CE | -0.085 (0.029)*** |

Source: data processed

Table 2 shows the results of the SUR models reveal that the economic growth variable does not exhibit a significant impact on Foreign Direct Investment (FDI) in ASEAN 8. The coefficient for this variable is 0.0179 with a probability of 0.392, which is smaller than the critical Z-table value (1.97). The conclusion from accepting H0 does not support the first hypothesis and contradicts previous research by Jayachandran & Seilan (2019) which stated a positive and significant impact of economic growth on FDI. The main contributing factor is primarily identified as the severe impact of the Covid-19 pandemic in 2020. This pandemic not only affected global health but also significantly impacted the world economy, with many countries experiencing negative economic growth and entering a recession. The decline in economic activities and disruptions in the supply and production chains led to a significant decrease in consumption. Investors became more cautious in allocating their investments amid global uncertainty, in line with push and pull factor theory.

The Labor Force variable shows a positive and significant impact on Foreign Direct Investment (FDI) in ASEAN 8. The calculated Z-value is 14.51, exceeding the critical Z-table value (1.97), with a coefficient for the variable of 1.00515 and a probability of 0.000. Rejecting the null hypothesis (H0) indicates that the labor force has a positive and significant impact on FDI in ASEAN+8. This finding aligns with previous research by Ullah & Khan (2017) the labor force has a significantly positive impact on FDI in ASEAN 8. The Investment Development Path (IDP) concept also supports this result, indicating that developing countries with a high labor force, such as ASEAN, tend to experience growth in FDI inflow. The availability of an adequate workforce opens up diverse business opportunities and enhances overall productivity. High productivity can reduce per-unit costs and increase business competitiveness in the global market. Therefore, labor force availability is an important consideration for investors in allocating capital, with a sufficient labor force likely to encourage investment due to an abundance of human resources.

The Regulatory Quality variable has a positive and significant impact on Foreign Direct Investment (FDI) in ASEAN 8. The calculated Z-value is 11.63, exceeding the critical Z-table value (1.97), with a coefficient for the variable of 0.0508728 and a probability of 0.000. Rejecting the null hypothesis (H0) indicates that the regulatory quality variable has a positive and significant impact on FDI in ASEAN 8. This finding supports the second hypothesis of the study and is consistent with previous research by Ullah & Khan (2017) stated that regulatory quality has a significantly positive impact on FDI in ASEAN 8. The concept or theory of the Investment Development Path (IDP) also proves

relevant, where developing countries with a high labor force, such as ASEAN, tend to experience growth in FDI inflow. The availability of an adequate workforce opens up diverse business opportunities and enhances overall productivity, thus increasing business competitiveness in the global market. The research findings also support Good Regulatory Practices (GRP), where the implementation of GRP in the business environment can create stability that supports investment, business, and trade activities. Awareness of the importance of GRP in creating a stable business environment is crucial for enhancing the potential for economic growth and global competitiveness. On the contrary, complex regulations can be a burden for multinational companies and hinder investment.

Table 2 shows the political stability variable shows a positive and significant impact on Foreign Direct Investment (FDI) in ASEAN 8. The calculated Z-value is 10.14, exceeding the critical Z-table value (1.97), with a coefficient for the variable of 0.038223 and a probability of 0.000. Rejecting the null hypothesis (H0) indicates that political stability has a positive and significant impact on FDI in ASEAN 8. This research finding supports the fourth hypothesis and aligns with the studies by Paul & Jadhav (2020) and Jayachandran & Seilan (2019) that political stability has a positive and significant impact on FDI in the ASEAN 8 countries. This finding is also in line with the Electric Paradigm theory, which emphasizes that key factors influencing investor decisions to invest involve stable political conditions and a robust legal enforcement system. Political stability is considered a crucial element that positively impacts the flow of Foreign Direct Investment (FDI). Unclear or unstable political conditions can be a serious obstacle for investors, as foreign investors are highly sensitive to such issues. Awareness of risks and uncertainties in the political environment makes investors prefer countries with guaranteed political stability. Therefore, creating a comfortable situation for investors not only involves political stability but also requires policies that support economic and legal stability.

The carbon emissions variable shows a negative and significant impact on Foreign Direct Investment (FDI) in ASEAN 8. The calculated Z-value is 2.98, exceeding the critical Z-table value (1.97), with a coefficient for the variable of -0.0854526 and a probability of 0.003. Rejecting the null hypothesis (H0) indicates that the carbon emissions variable has a negative and significant impact on FDI in ASEAN 8. The findings from this research consistently support the fifth hypothesis and align with the studies by Yuksel et al (2020) and Opoku (2022) that carbon emissions have a negative and significant impact on FDI in the ASEAN 8 countries. This illustrates that countries with low environmental quality, especially those marked by high carbon emissions, may reduce investor interest in making investments in those countries. This study aligns with the theory suggesting that nations with high carbon emissions face criticism and encounter social and economic challenges. Foreign investors, taking various factors into account when entering a country's market, consider issues related to high carbon emissions. Consequently, investors might be hesitant to invest in countries grappling with carbon emission problems, resulting in diminished investments, elevated unemployment rates, and a downturn in economic growth in those nations.

4. Conclusion

The main factors in determining capital flow such as domestic policies for high productivity levels, stable economic growth, a strong macroeconomic foundation, macroeconomic stability, and structural reforms. Based on the result that economic growth has no direct effect on ASEAN 8 FDI, this is because it can be attributed to external factors that influence foreign investment decisions by investor countries. If investors experience the impact of the global crisis, it becomes an obstacle to allocating investment. Labor has a positive effect on FDI considering that the existence of an adequate workforce can be an incentive for investors to invest capital, considering the abundant availability of human resources. Regulatory quality also shows a positive impact, indicating that a country's ability to provide good regulations can increase market stability and attract FDI to that country. Political stability also has a positive influence which is considered an important factor in increasing investment. In addition, carbon emissions have a negative impact on FDI in the ASEAN+8 region, where countries that have high levels of carbon emissions, as a sign of low environmental quality, can reduce investment interest in the region.

Implication of the study the government should consider strategies to encourage the development and improvement of workforce qualifications. Such as providing training and education according to industry needs as well as improving education and training infrastructure to support the development of skills needed by foreign investors. And the government must also create programs responsive to

global market demands and ensure the availability of quality workers. The government must consider efforts to increase the sustainability of regulatory effectiveness. collaborate with the private sector and international institutions to obtain information and input for regulatory reform.

Acknowledgment

The article was prepared by Rastiati under the guidance of Mr. Rifki Khoirudin, S.E., M.Ec.Dev., MAPPI(Cert). The culmination of this study represents the researcher's individual effort. The researcher acknowledges and appreciates the World Bank for supplying the data and information that form the fundamental basis of this research. Gratitude is also extended to the Development Economics Program at Ahmad Dahlan University for the supportive academic environment that allowed the development of ideas and understanding in completing this research. The researcher anticipates that the outcomes of this study will offer benefits and make positive contributions to various stakeholders, including academia and the government.

Declarations

- Author contribution** : This research is a collaboration of all authors involved, from the research design, data analysis, to the final writing.
- Funding statement** : The research was undertaken through individual endeavors and did not receive financial assistance from any external party. The authors bear full responsibility for the funding and execution of this study without engaging external funding sources.
- Conflict of interest** : The authors have disclosed that there are no conflicts of interest to declare.
- Additional information** : No additional information is available for this paper.

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